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(54) Title: METHOD FOR COMMUNICATING DATA BETWEEN DIFFERENTLY STRUCTURED DATA FILES
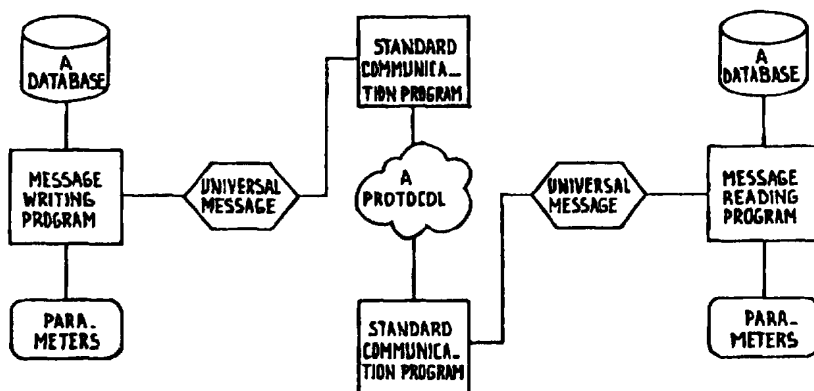
(57) Abstract

The invention relates to a method for communicating data by transmitting messages between differently structured data files, in which data files the data are stored in fields with different field names or field descriptions. The invention describes a method for data communication without fixed formats and protocols and being agreed between all parties, in which it is possible to transmit data of each application with any file structure to any other application, file structure and computer system.

Method for communicating data between differently structured data files

In practice an increasing amount of data is exchanged between computer applications with different file structures, installed on dif-
5   ferent computers, localized at more or less large mutual distance and programmed, used, and managed by different persons or organizations. For transferring low data volumes in an unstructured format standard elec-tronic mail software (Email) is used. For transferring large data vol-umes in a format, which is agreed by the users, use is made of a "file
10 transfer" specifically developed for each type of transfer, or of an EDI (electronic data interchange) system, developed for each type of trans-fer.

EP 0,449,494 describes a system for transferring data between two systems each using its own data format and both using the same data
15 structure. In principle data is transmitted by a sender in its own native format and converted by the receiver which for that purpose dis-poses of a dedicated conversion program. If differently structured data-bases are involved then each database should be related to a number of dedicated conversion programs to enable communication between the vari-
20 ous databases.

US 5,119,465 describes a system for transferring data between two databases each using its own data format. To solve the data format prob-lem a format conversion system is developed. According to this prior art publication the sender disposes of front end converter for converting a
25 source data structure in a source format to data for an intermediary. The back end converter converts the data from the intermediary to a target data structure in a target data format used by the receiver. The intermediary includes a rather complicated domain conversion arrange-ment. The various conversion processes are controlled by a converter
30 executive.

This prior art system is destined to be used on one computer sys-tem to enable data transfer between applications with different data format and/or different data structure and is not suited for communicat-ing data between different computers using standard communication chan-
35 nels and commercially available communication software.

EP 0,130,375 also describes a system for transferring data between two computers each using its own data format, both using the same data structure. To solve the data format problem a format conver-

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sion system is developed for converting one specific format into another specific format. This prior art system is restricted to the selected specific formats and structures and has therefore no universal applicability.

An object of the invention is now to provide a universally applicable system which is independent of the number of differently structured databases and the number of computers involved and requires only a restricted amount of software.

The invention describes a system (called PMS) for transfer of medium large volumes in a format which is not fixed or formally agreed by the parties (see figure 1).

The method

The method according to the invention (PMS = Packet Message System) comprises the following components and procedures.

The sender of an amount of data to be transferred (hereinafter called: a message) disposes of a software program (hereinafter called the message writing program) offering the possibility to compile various messages (variable in structure and composition) from its own specific data collection and to get these messages as separate files ready for transmission. Thereafter, the message can be transmitted using one of the standard on the market available programs for data communication, using a protocol which is supported by the message receiver.

The message is received with one of the standard on the market available data communication programs using the respective protocol.

The message receiver disposes of a software program (hereinafter called the message reading program) offering the possibility to add data from the various messages (variable in structure and composition) to its own specific data collection.

The dedicated message writing program and the dedicated message reading program are able to compose or process respectively various messages by adding parameters to the programs to connect the file structure of the own data collection with its own different field names and/-or descriptions to the data structure and the field names and/or descriptions of the various messages.

For writing and reading messages a table with message models (message model table) is offered to the writing/reading software. For reading and writing the own specific data collections a table with field

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names (connecting table) is offered to the writing/reading software (see also figure 2).

The Universal Message

The basis of the method is a universal message. That is the description of all possible messages based on some prescribed rules. All possible messages are specific but have a universal frame. The message contains fields with cells each having a serial number within the message. The only thing to be transmitted is the succession number of the cell within the message followed by the contents of the cell. In that way the serial number forms the label of the succeeding value.

As field types the message distinquishes between cells in tables, cells in repetitive groups and single cells. The following rules apply:
- A table is a series of cells which always appears only once.
- A row is a repetitive group of cells which either appear not or appear N times.
- A table, row, or cell can be obligatory or not.
- Within tables and rows other tables and rows can be present.
- Cells can appear within or outside tables and rows.
- The first table, row, or cell within a table or row is always obligatory.

Using these rules it is possible to draft simple (flat file) messages, however, also complex forms which are practically unlimited in length and dimensions can be drafted by defining repetitive groups within repetitive groups.

Messages are drafted in agreement with the method and read by comparing the labels (field serial number) to the corresponding unique element numbers as are defined in the message model to be consulted. According to the method values are retrieved and positioned by comparing the unique element number with the numbers in a connecting table in which the position in the own data structure is indicated.

Message-model-table

The message-model-table comprises the following data:

| Message name | The PMS name of the message |
| Field serial number | The serial number of the field within the message |

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Type	T (table), R (row or repetitive group) or C (cell)
Obligatory	Field is obligatory or not
Parent	Higher order field serial number in a field hierarchy
Element number	The unique PMS number of the element which should be inscribed in that field

Additional data can be added to simplify or speed up the processing, such as:

Message number	The unique PMS message number
Message version	The version of the message
Group name	The name of a group (= table or row)
Status	For instance C (copy) F (fixed) P (presentation) O (object)
Element name	The unique PMS name of the element

The connecting table

The connecting table comprises the following data:

Message number	The unique PMS number of the message
Element number	The unique PMS number of the element
Own application	The name of the application from which this message was drafted or in which the message will be input
Own file	The name of the file inside the application from within the message was drafted or in which the message was input
Own label	The label of the own field within the own file for the respective contents

Additional data can be included to speed up or simplify the processing, for instance:

Message version	The version of the message
Codes/Indexes	For instance: bKey, bWhile, bFor, bExpr, for an application programmed in Clipper
Format	The format of the element (for instance: numerical)

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Code table	The name of a code table to be used eventually
Element name	The unique PMS name of the element
Description	The description of the element to be used also as Help-text in the software

Example of a message model

| Message name | : School children |
| Version number | : 1.0 |

Serial number	Type	Obligatory	Parent	Element number	(Element and group names)
1	T	Y	0		Control data
2	C	Y	1	464661	Model name of the message
3	C	Y	1	548957	Version number of the model name
4	C	Y	1	980931	Name of the sender
5	C	N	1	989243	Data line number of the sender
6	C	N	1	323499	Name of the receiver
7	C	Y	1	187867	Data line number of the receiver
8	R	Y	0		Schools
9	C	Y	8	565088	Name of the school
10	R	Y	8		Classes
11	C	Y	10	466610	Class indication
12	R	N	10		Children
13	C	Y	12	465683	Name of the child
14	C	Y	12	654809	Age of the child

Example of a message in agreement with the above described model

2,School children

3,1.0

4.van der Meer

7,0123-456789

9,The Weather-vane

11,class 2

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13,Jan
14,7
13,Piet
14,8
9,The Circle
11,class 2
11,class 3
13,Klaas
14,8
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The writing program

The message-writing-program retrieves from the message model table the model of the message to be drafted. The program reads one by one the serial numbers with corresponding PMS element numbers from the model. On the basis of the PMS element number the own connecting table is searched to retrieve the corresponding value in the own application/file/field. The retrieved value, preceded by the field serial number from the message model, is placed in the message. As soon as the message is drafted the message is ready to be transmitted.

The reading program

After receiving the message the message reading program is started. The message reading program retrieves a model of the received message from the message model table. The program reads one after the other the serial numbers with the succeeding values from the message. By consulting the message model for each serial number the corresponding PMS-element number can be found. With the PMS-element number the own connecting table van be searched to retrieve the own application/file/field in which the corresponding value should be inserted. The received value is input in the respective field. After processing the message the program is finnished.

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Claims

1. Method for communicating data by transmitting messages between differently structured data files at the transmission side and the receiving side, in which data files the data are stored in fields with different field names or field descriptions, which method is characterized by the combination of the following steps:

a) the field names or field descriptions of corresponding data in various files are related to a set of standard labels,

b) data to be transmitted is combined in a message at the transmission side with the label which is related to the field name of the field in which the data was stored and at the receiving side, the field name of the transmitted data at the reception side is obtained based on the received label and the defined relations in the standard set,

2. Method according to claim 1, characterized in that in case multiple data are transmitted the labels with corresponding data are combined in a message in which the labels with corresponding data are appearing in a predetermined order.

3. Method according to one of the preceding claims, characterized in that at the transmission side the data to be transmitted are retrieved by means of a form comprising fill in fields, whereby the field names are formed by the names or descriptions valid at the transmission side.

4. Method according to one of the preceding claims, characterized in that at the receiving side the transmitted data are inscribed in a form comprising fill in fields for filling in the received data, whereby the field names are formed by the names or descriptions valid at the reception side.

5. Method according to one of the preceding claims, characterized in that the descriptions at the transmission side and at the reception side are drafted in a different language.

6. Method according to one of the preceding claims, characterized in that to each data file a table is added in which the descriptions and

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the thereto related labels are stored.

7. Method according to one of the preceding claims, characterized in that to each data file a table is added in which a number of different forms are stored each comprising a unique parameter which parameter is added to the message at the transmission side and is used at the reception side to select the corresponding form.

8. Method according to one of the preceding claims, characterized in that to each data file a table is added in which the names of a number of different data files are stored each related to a unique parameter and that at the transmission side this parameter is added to the message and at the reception side the parameter is used to select the corresponding data file.

9. Method according to one of the preceding claims, characterized in that the data files are present on various computers and that the transmission of data is performed through an arbitrary available communication route.

10. Method according to one of the preceding claims, characterized in that for communicating data from different data files a separate file is used, comprising a variable structure consisting of serial numbers and values, whereby the serial numbers for a predetermined structure are obtained by selecting from tables rows and cells in a model.
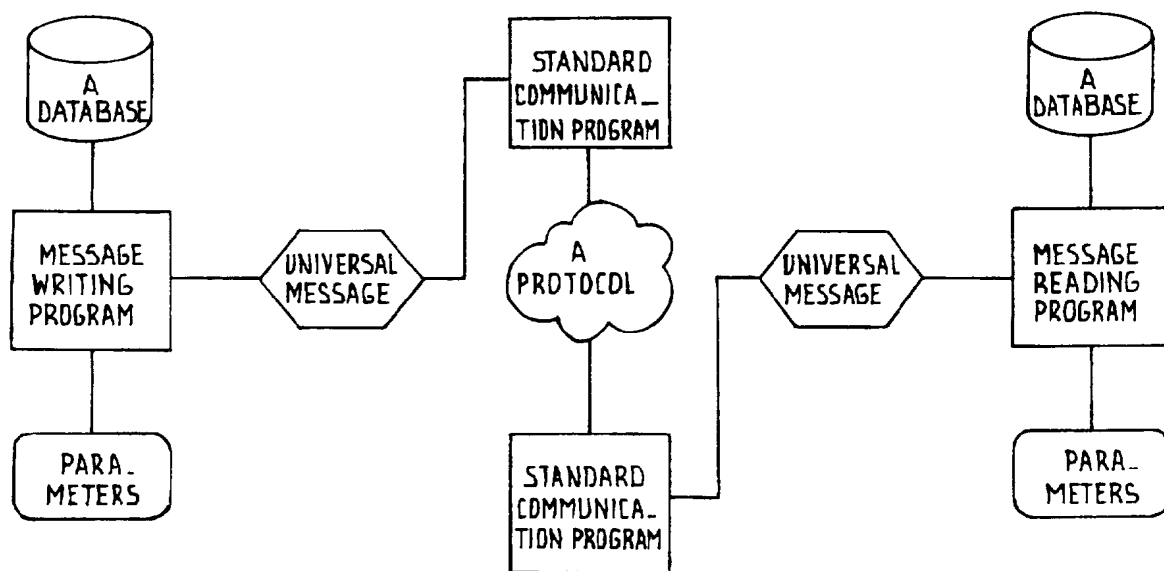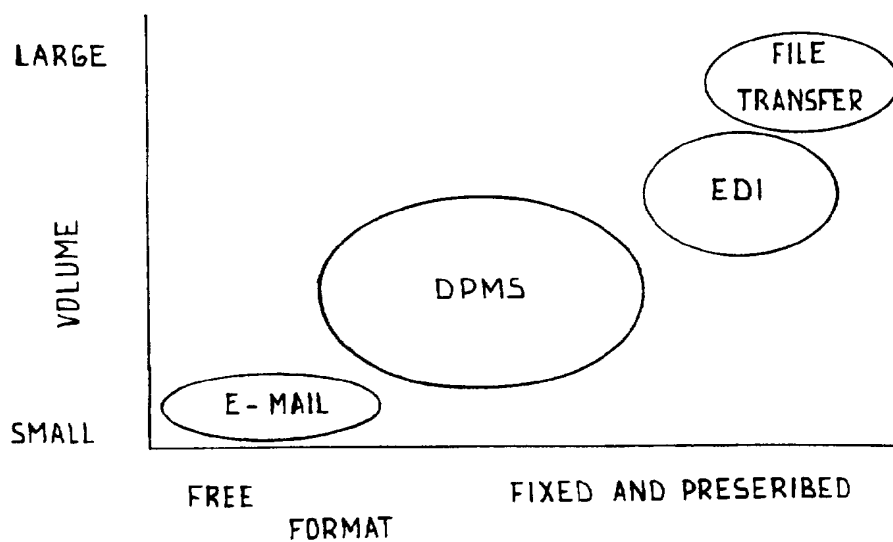
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fig - 1

fig - 2

COMMUNICATION CLASSES

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6   G06F17/30

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6   G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 449 494 A (IBM) 2 October 1991 cited in the application see page 3, column 2, line 18 - page 4, column 4, line 22 ---	1,5,9
A	US 5 119 465 A (JACK MARTIN L ET AL) 2 June 1992 cited in the application see column 1, line 50 - column 3, line 20 ---	1,5,9
A	EP 0 130 375 A (IBM) 9 January 1985 cited in the application see abstract see page 2, line 8 - page 2, line 34 -----	1,3,4

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

Date of the actual completion of the international search	Date of mailing of the international search report
4 April 1997	16.04.97

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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